WHO'S WHO AMONG THE FERNS

W. I. BEECROFT

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WHO'S WHO
AMONG
THE FERNS

Clayton's Fern.

WHO'S WHO AMONG THE FERNS

COMPILED AND ILLUSTRATED

BY

W. I. BEECROFT

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PREFACE

It almost goes without saying that this modest volume is not expected to meet the demands of the experienced and systematic botanist. It is designed merely to aid those who, having the love of Nature in their hearts, desire a more intimate acquaintance with those beautiful and interesting plants, the ferns; and if in the perusal of its pages it leads one to hitherto unknown fields, to discover for himself the new delights and hidden beauties that exist on every hand, thereby contributing a little more to the sum of human happiness, its mission will be fulfilled.

W. I. B.

Boston, October 30, 1909.

INTRODUCTION

THE FROND

It seems fitting that so many of the flowerless plants should so fully compensate for the absence of flowers by the beauty of their foliage. Certainly no class of plants is more graceful or more beautiful in form than the ferns; yet, although they are universally admired, they are, unfortunately, little known. Their unobtrusive habits and their obscure methods of reproduction lend an air of mystery to these plants which, in the olden time, gave rise to numerous absurd notions and traditions. But the days of superstition are passed, and if one would become familiar with the ferns he should first learn the meaning of certain structures, and though their life histories may be somewhat complicated, he can, at least, form a general idea of the development of a fern.

Fig 1.—Prothallia and Young Fronds.

On the under side of the fronds of most species numerous small dots may be found. These are sometimes erroneously called the "flowers" of the fern, though structurally, they bear no resemblance to flowers. These small bodies termed fruit dots or *sori* (singular *sorus*) constitute the fruiting organs of the fern. In their earlier stages they are, in most species, covered with a membrane called the *indusium* (plural *indusia*) which protects a collection of tiny globes called *sporangia* (singular *sporangium*). The indusium at the proper time withers and disappears, exposing the sporangia. In each sporangium is produced a large number of tiny bodies called *spores,* which are liberated at maturity by the snapping open of the sporangia or spore-cases, and from these spores, under favorable circumstances, the new plants arise. In view of this fact the natural inference might be that they are seeds, but they bear no more resemblance to seeds than the sori do to flowers. They only correspond to seeds inasmuch as they serve to carry the plants through a resting stage, and scatter the species far and wide. A germinating spore does not give rise immediately to a plant like the parent as true seeds do. Instead, it develops into a small, flat, green, heart-shaped body, scarcely a quarter of an inch across, called the *prothallium* (plural *prothallia*) (Fig. 1). On the under side of the prothallium are borne two minute organs, and by the union of their contents a tiny fern develops.

While spores are produced by all species of ferns, some employ other methods of propagation

as well, such as by means of bulblets, runners, or by the rooting of the bent tip of the frond.

A frond bearing sporangia is known as a *fertile* frond in contradistinction to the unfruitful or *sterile* ones. In a large number of species the two kinds of fronds closely resemble one another, while in others they would scarcely be recognized as belonging to the same plant.

A frond is said to be *pinnate* when its divisions are cut entirely to the midrib (Fig. 2–A). The divisions are called *pinnae* (singular *pinna*). When a frond or pinna is not cut entirely to the midrib it is said to be *pinnatifid*, and the divisions are termed *segments* or *lobes* (Fig. 2–B). When the pinnae are divided to their midribs the frond is said to be *twice pinnate*, and the second divisions are called *pinnules* (Fig. 2–C).

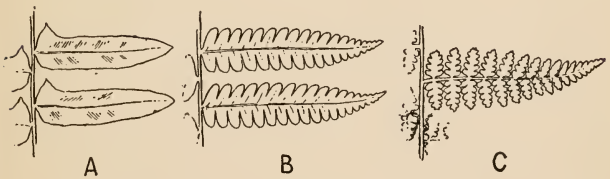
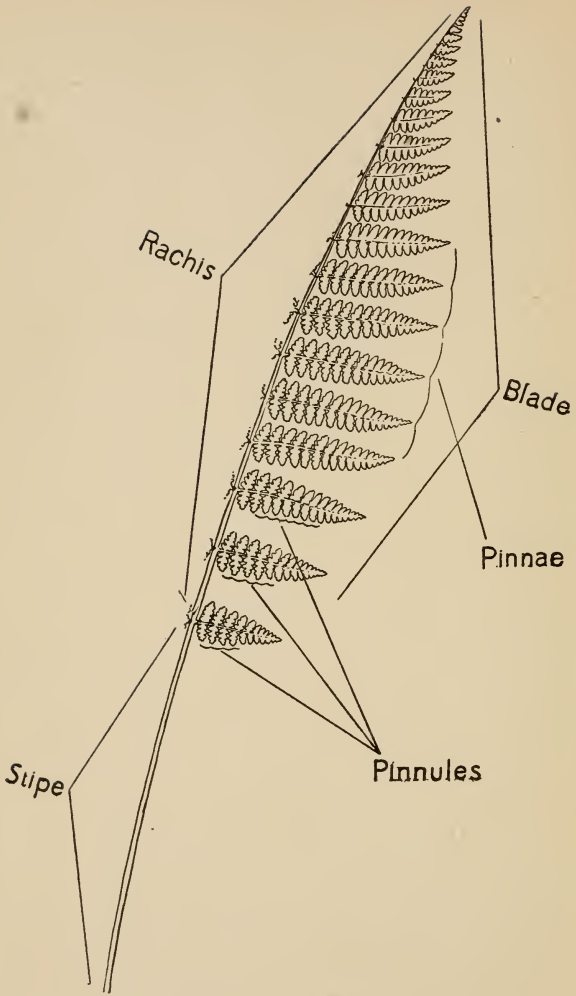


Fig. 2.

By holding a frond to the light it may be seen to be intersected by numerous veins. When these veins branch they are said to be forking; when they terminate without connecting with one another, they are said to be free.



Parts of a Frond.

HOW FERNS ARE CLASSIFIED.

The ferns are classified in groups chiefly by the shape and position of the sori and indusia, so it is necessary, in most cases, for the beginner to obtain a fertile frond in order to identify the species with certainty. In some species the indusium is quite evanescent, and the specimen should be obtained before the indusia have withered. Since the different species of ferns mature at various times throughout the season, the student must be watchful from early summer until fall in order to secure specimens when in the proper stage. The beginner will doubtless make some mistakes at first. The young fronds of some of the large species will be examined until the absence of any fruiting portion discloses their identity and one recognizes an old acquaintance. Moreover, some species are exceeding variable in the cutting of their fronds. In fact, constancy can hardly be said to be the rule among the ferns, and it is a matter of much observation and study before one can expect to recognize at once the different species in their various forms.

In the study of the ferns a good pocket lens is indispensable. The specific differences of some of the species are often quite minute.

The nomenclature adopted in this book is that of Gray's "Manual." The territory covered is, in general, the eastern half of the United States north of the Gulf States and the adjacent portion of Canada.

KEY TO THE GENERA

The distinguishing characters of the different genera may be found by referring to the following key, and with the genus known it is usually an easy matter to ascertain the species. It will be observed that the fruiting portion of the ferns is not always on the backs of the ordinary fronds; in some species it is borne on separate stalks. For this reason the ferns are divided into two general classes in the key:

1st.— Those in which the sporangia are *not* borne on the backs of the ordinary fronds.

2nd.— Those in which the sporangia *are* borne on the backs of the ordinary fronds.

Sporangia not borne on the backs of the ordinary fronds.

Osmunda.

Fruiting portion borne in the middle of the frond.

Clayton's Fern, *A*.

PAGE

Fruiting portion on long, woolly, brown stalk. Cinnamon Fern, *B.*

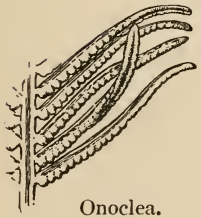
Fruiting portion on the tips of twice pinnate fronds. Royal Fern, *C.* Large ferns growing in clumps.

OSMUNDA. 12

Onoclea.

Fruiting portion in green, berry-like structures, in a twice pinnate spike; sterile fronds broad and coarse. Sensitive Fern.

ONOCLEA. 54



Onoclea.

Fertile frond pinnate; pinnae very narrow, with beaded edges; large species. Ostrich Fern.

ONOCLEA. 58

Ophioglossum.

Fruiting portion on stalk rising above a simple, leaf-like frond; plants small. Adder's Tongue.

OPHIOGLOSSUM. 182

Botrychium.

PAGE

Fruit borne in a more or less branching spike rising above the sterile frond. Grape Ferns; Moonwort.

BOTRYCHIUM. 186

Schizaea.

Fruit borne in a one-sided spike; sterile fronds almost thread-like; plants small. Curly Grass.

SCHIZAEA. 172

Lygodium.

Fruiting portion at the apex of the frond; sterile pinnae or frondlets small, divided into finger-like lobes; rachis twining. Climbing Fern.

LYGODIUM. 174

PAGE

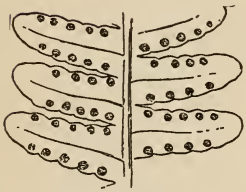
Sporangia borne on the under side of the ordinary fronds, sori in dots or lines.

Polypodium.

Indusium wanting, *A*.
Indusium present, formed by the reflexed margins of the pinnules, *B*.
Indusium present, not formed by the reflexed margins of the pinnules, *C*.

A — Fruit dots large, roundish; evergreen, rock species. Polypody.

POLYPODIUM. 130



Phegopteris.

Fruit dots roundish, small, fronds triangular. Beech Ferns.

PHEGOPTERIS. 72

Notholaena.

Fruit dots roundish or oblong, soon forming an irregular marginal band; under surface of pinnules covered with a whitish powder. Cloak Fern.

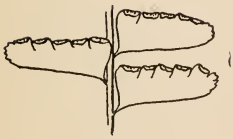
NOTHOLAENA. 160

Pteris.

PAGE

B — Sporangia in a continuous line along the margins of the pinnules, the indusium formed by the reflexed edges; fronds large. Brake.

PTERIS. 60



Adiantum.

Sporangia marginal, borne at the ends of the veins, the indusium formed by the reflexed tips of the lobes of the pinnules; pinnules have no midrib, veins springing from the base or from the lower margin; stipes dark. Maidenhair.

ADIANTUM. 138

Pellaea.

Sporangia marginal, indusium broad, nearly continuous, formed by the reflexed edges of the pinnules; fronds smooth, stipes dark; rock species. Cliff Brake.

PELLAEA. 62

Cheilanthes.

PAGE

Sporangia marginal, indusium formed by the reflexed ends of the roundish lobes, soon pushed back by the enlarging sporangia; fronds usually hairy. Lip Ferns.

CHEILANTHES. 122

Cryptogramma.

Fruiting pinnules long, pod-like, indusium formed by the reflexed edges reaching to the midrib, opening later quite flat; sterile fronds shorter than the fertile with broader divisions. Rock Brakes.

CRYPTOGRAMMA. 66

Trichomanes.

C — Fruit dots marginal, terminating a vein, sporangia at the base of a long, bristle-like receptacle, surrounded by a cut-shaped indusium which is two-lipped at the mouth. Filmy Fern.

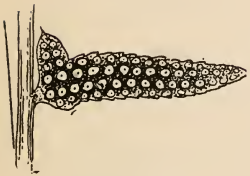
TRICHOMANES. 178

PAGE

Woodwardia.

Fruit dots elongated, borne in chain-like rows parallel to the midribs of the pinnae and lobes, opening on the side next to the midrib; large, water-loving species. Chain Ferns.

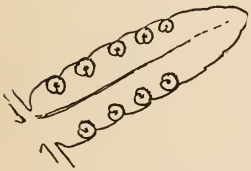
WOODWARDIA. 118



Polystichum.

Fruit dots roundish, indusium fixed by the center; evergreen. Christmas Fern; Holly Ferns.

POLYSTICHUM. 80



Aspidium.

Fruit dots roundish, indusium roundish or kidney-shaped, attached at the base of a notch. Shield Ferns.

ASPIDIUM. 90

Cystopteris.

Fruit dots roundish, indusium hood-like, attached by a broad base and arching over the sporangia, opening on the side toward the apex of the lobes, soon withering. Bladder Ferns.

CYSTOPTERIS. 164

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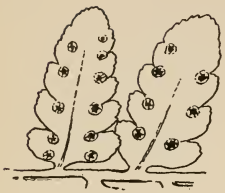


Woodsia.

Fruit dots roundish, indusium fixed beneath the sorus and enclosing it when young, bursting at the top into several irregular segments, soon withering; rock species.

WOODSIA. 142

Dicksonia.

Fruit dots small, globular, borne on reflexed toothlets of the pinnules; indusium cup-shaped, fixed beneath the sorus, open at the top; fronds finely cut. Hay-scented Fern.

DICKSONIA. 158

Scolopendrium.

Fruit dots long and narrow, almost at right angles to the midrib, borne in pairs between two veins, opening along the middle; blade long, undivided. Hart's Tongue.

SCOLOPENDRIUM. 162

Camptosorus.

PAGE

Fruit dots elongated, irregularly scattered, some parallel to the midrib, others oblique to it; blade tapering into a long slender tip. Walking Fern.

CAMPTOSORUS. 154

Asplenium.

Fruit dots mostly oblique to the midrib, straight or curved, sometimes crossing a veinlet; indusium fixed on one side, opening on the side next the midrib; fronds variously lobed or divided. Spleenworts; Lady Fern.

ASPLENIUM. 24

THE FLOWERING FERN FAMILY

CLAYTON'S FERN; INTERRUPTED FERN:
Osmúnda Claytoniàna.

Sterile and fertile fronds dissimilar; sterile fronds large, pinnate; pinnae lance-shaped, deeply pinnatifid into numerous blunt divisions. Fertile fronds usually taller than the sterile, 2 to 4 feet high; sporangia borne on much transformed pinnae near the middle of frond, greenish in appearance at first, afterward turning brown.

Found in low grounds from Newfoundland to Minnesota, south to North Carolina, Kentucky and Missouri.

NOTES.

Clayton's Fern.

CINNAMON FERN; BRAKE:

Osmúnda cinnamòmea.

Sterile and fertile fronds dissimilar; sterile fronds often 6 feet in height, growing in a circle and spreading out in a vase-like form, pinnate; pinnae lance-shaped, deeply pinnatifid with blunt divisions; fertile fronds stiff, reddish-brown, club-like structures, which wither and disappear early in the summer after the spores are shed; the young unrolling fronds or "croziers" often called "fiddleheads."

The sterile fronds much resemble those of *O. Claytoniana,* from which they may be distinguished by the little tufts of wool at the base of each pinna.

Common in swampy places and low ground, widely distributed.

In the variety *incìsa* the segments of the pinnae are more or less cut or pinnatifid.

NOTES.

Cinnamon Fern (a).

NOTES.

Cinnamon Fern (b).

ROYAL FERN; FLOWERING FERN:

Osmúnda regàlis.

Fronds 2 to 6 feet tall, growing in clumps, often in shallow water, twice pinnate, the large and rather distant pinnae and pinnules giving them a light and airy appearance; sterile and fertile fronds alike, except that in the latter the upper pinnae are changed into spore-bearing organs.

Found usually in moist places, widely distributed.

NOTES.

Royal Fern (a).

NOTES.

Royal Fern (b).

NOTES.

THE POLYPODIUM FAMILY

LADY FERN: *Asplènium Filix-fémina.* (*Athyrium Filix-femina.*)

Fronds 1 to 4 feet high, twice pinnate, exceedingly variable in their cutting; pinnae lance-shaped, acute, the pinnules deeply cut and toothed.

Fruit dots borne in a double row on the pinnules, at length running together. When young they extend in a horseshoe shape across the veins which bear them, later becoming almost straight.

Common in moist woods in nearly all parts of the United States.

NOTES.

Lady Fern.

SILVERY SPLEENWORT:

Asplènium acrostichoìdes.

(*A. thelypteroides; Athyrium acrostichoides.*)

Fronds 2 to 3 feet high, growing in clumps, narrowed toward the base, pinnate; pinnae long lance-shaped, with crowded, obtuse, minutely toothed lobes; fertile fronds appearing later than the sterile.

Fruit dots numerous, slightly curving, borne in a double row on the lobes oblique to the midvein of the lobes.

Found in moist woods from Nova Scotia to Minnesota, Georgia and Alabama.

NOTES.

Silvery Spleenwort.

NARROW-LEAVED SPLEENWORT:

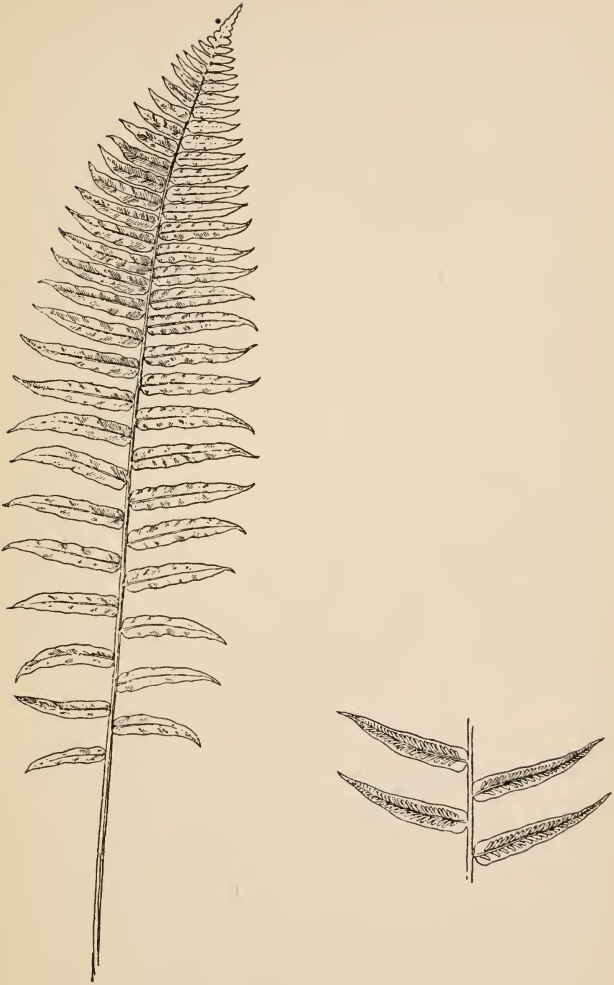
Asplènium angustifòlium.
(*Athyrium angustifolium.*)

Fronds 2–4 feet high, growing in clumps, thin and delicate, simply pinnate; pinnae long, narrow, tapering toward the tip; fertile fronds taller than the sterile, and pinnae much narrower, appearing in midsummer.

Fruit dots elongated, numerous, in two rows, opening on the side next the midvein.

Found in moist woods from western Quebec and New Hampshire, to Minnesota and southward.

NOTES.



Narrow-Leaved Spleenwort.

EBONY SPLEENWORT:

Asplènium platyneùron.
(*A. ebeneum.*)

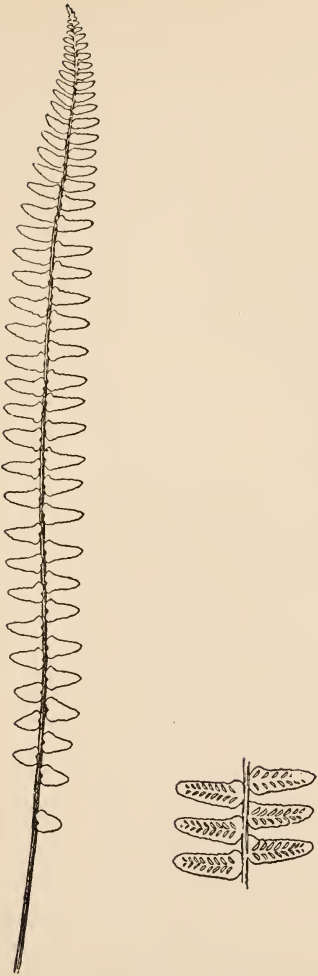
Fronds upright, 8 to 20 inches high, growing in little tufts; fertile fronds much taller than the sterile, with more distant pinnae, pinnate; pinnae usually alternate, inclined to be eared on both sides, finely toothed or incised; stipe dark and shining.

Fruit dots elongated, borne in a double row on the pinnae, nearer the midvein than the margin.

Found in rocky soil from Maine to Colorado, and southward.

In the variety *serràtum* the pinnae are more or less deeply toothed.

NOTES.



Ebony Spleenwort (a).

NOTES.

Ebony Spleenwort (b).

SMALL SPLEENWORT:

Asplènium párvulum.
(*A. resiliens.*)

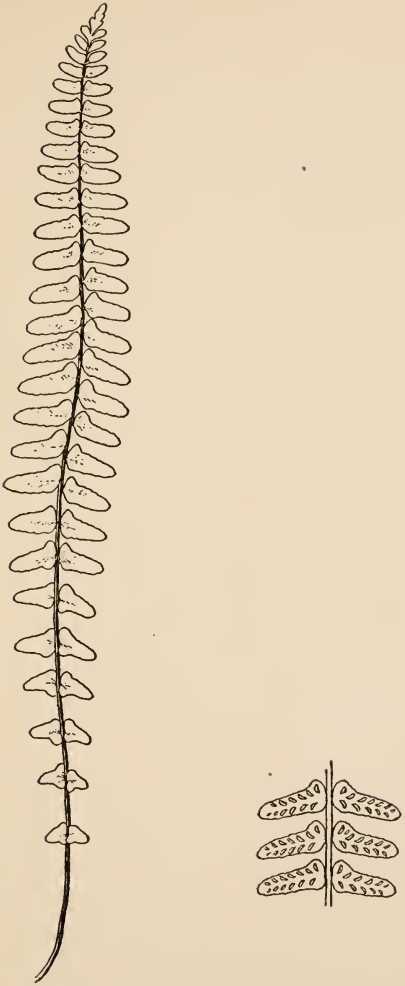
Fronds upright, 4 to 10 inches in height, pinnate; pinnae mostly opposite, blunt, slightly eared on the upper side, or often on both upper and lower sides; stipe and rachis dark and shining.

Resembles the ebony spleenwort but differs in the pinnae being usually opposite, and the sterile and fertile fronds of the same size.

Fruit dots borne on the backs of the ordinary fronds in two rows on the pinnae.

Found in rocky places from Virginia to Kansas, and southward.

NOTES.



Small Spleenwort.

WALL RUE; RUE SPLEENWORT:

Asplènium Ruta-murària.

Fronds seldom more than 5 inches high, growing in tufts, twice or three times pinnate at the base, with stalked pinnae and pinnules; pinnae usually alternate; pinnules wedge-shaped, with outer margin slightly toothed; rachis and stipe green.

Nearly every frond fertile, 2 to 4 fruit dots borne on each pinnule.

Found on limestone cliffs from Vermont to Ontario, Michigan and southward.

NOTES.

Wall Rue.

MOUNTAIN SPLEENWORT:

Asplènium montànum.

Fronds 2 to 6 inches long, broadest at the base; lowest pinnae stalked, pinnate or pinnatifid with toothed lobes, the upper ones becoming simpler.

Fruit dots irregularly scattered, borne on almost every frond.

Found on cliffs and rocks from Connecticut to Ohio, Kentucky, Arkansas and southward.

NOTES.

Mountain Spleenwort.

SCOTT'S SPLEENWORT:

Asplènium ebenoìdes.

Fronds 4 to 8 inches high, lance-shaped, pinnatifid or pinnate below, deeply pinnatifid above, divisions broadest at the base, with considerable variation in their shape and cutting; apex usually long and slender, often producing young fronds at the tip; stipes dark and shining. Demonstrated by Miss Margaret Slosson to be a hybrid between the walking fern and the ebony spleenwort.

Fruit dots as in other spleenworts.

Found on limestone cliffs from Vermont to Missouri, and southward; very rare.

NOTES.

Scott's Spleenwort.

PINNATIFID SPLEENWORT:

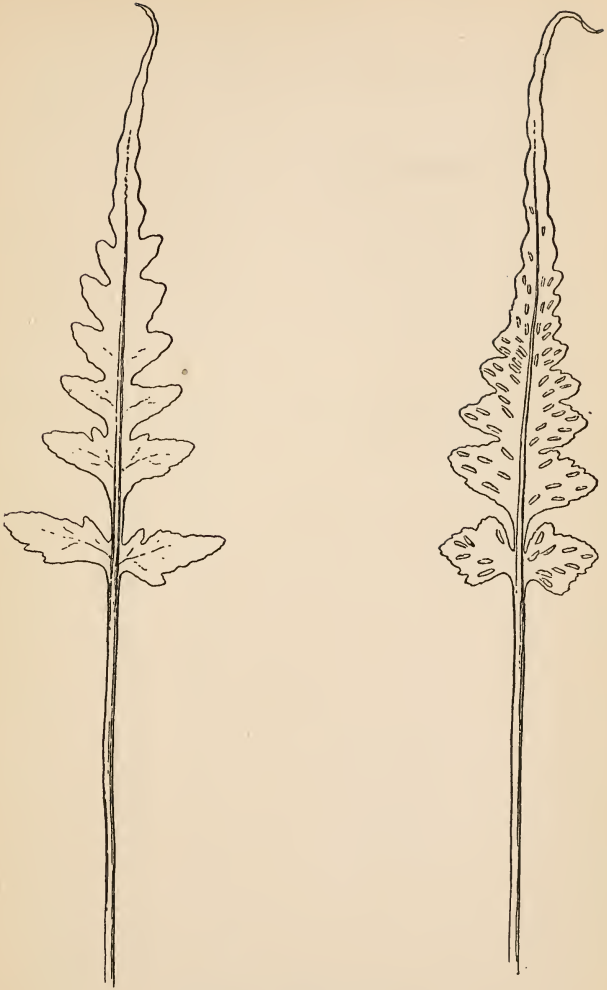
Asplènium pinnatífidum.

Fronds 3 to 8 inches long, lance-shaped, pinnatifid or pinnate below with roundish lobes, tapering above into a slender prolongation, which sometimes takes root at the tip after the manner of the walking fern. There is considerable variation in the cutting of the fronds; stipe brownish, becoming green above.

Fruit dots scattered, borne on the prolongation as well as the lobes.

Found on rocks from Connecticut to Missouri and southward; rare.

NOTES.



Pinnatifid Spleenwort.

MAIDENHAIR SPLEENWORT:

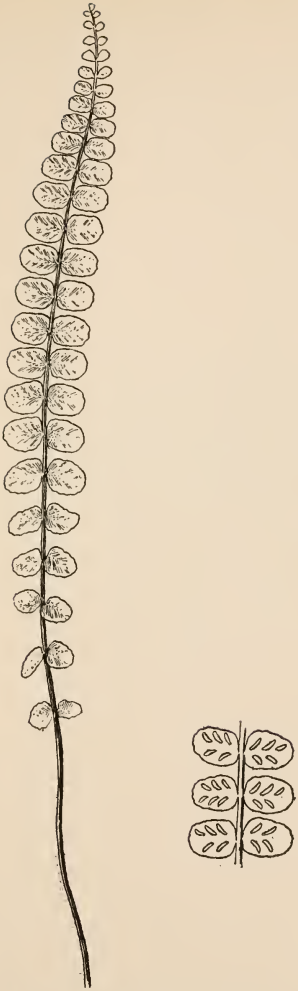
Asplènium Trichómanes.

Fronds seldom more than 8 inches long and half an inch wide, growing in spreading tufts, pinnate; pinnae roundish or slightly elongated, more or less toothed; stipe and rachis dark and shining.

Fruit dots oblong, borne on the backs of the ordinary pinnae, oblique to the midvein.

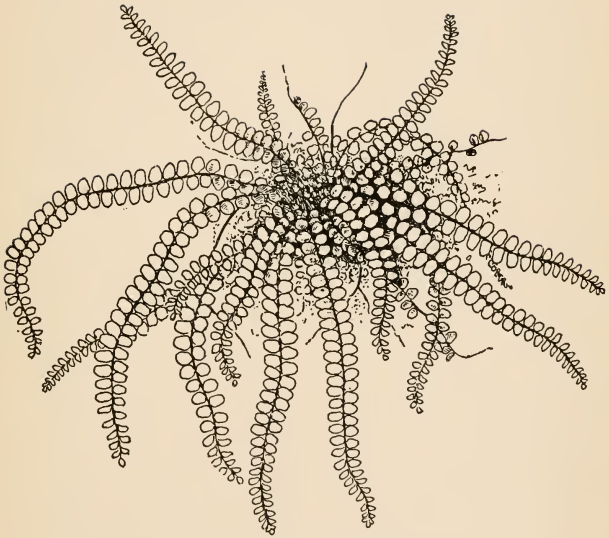
Found on shaded rocks, widely distributed.

NOTES.



Maidenhair Spleenwort (a).

NOTES.



Maidenhair Spleenwort (b).

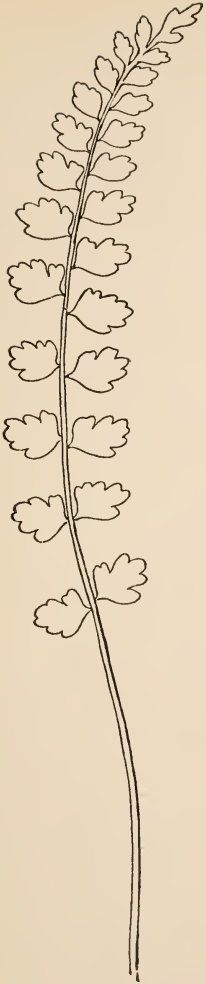
GREEN SPLEENWORT: *Asplènium víride.*

Fronds usually less than 6 inches long, growing in little tufts, pinnate; pinnae roundish, short-stalked, round-toothed; stipe brownish at the base, passing into a green rachis. This feature serves to distinguish it from the maidenhair spleenwort, which it closely resembles.

Fruit dots borne on the backs of the ordinary fronds.

Found on shaded limestone from Newfoundland to northern New England, westward and northward.

NOTES.



Green Spleenwort.

BRADLEY'S SPLEENWORT:

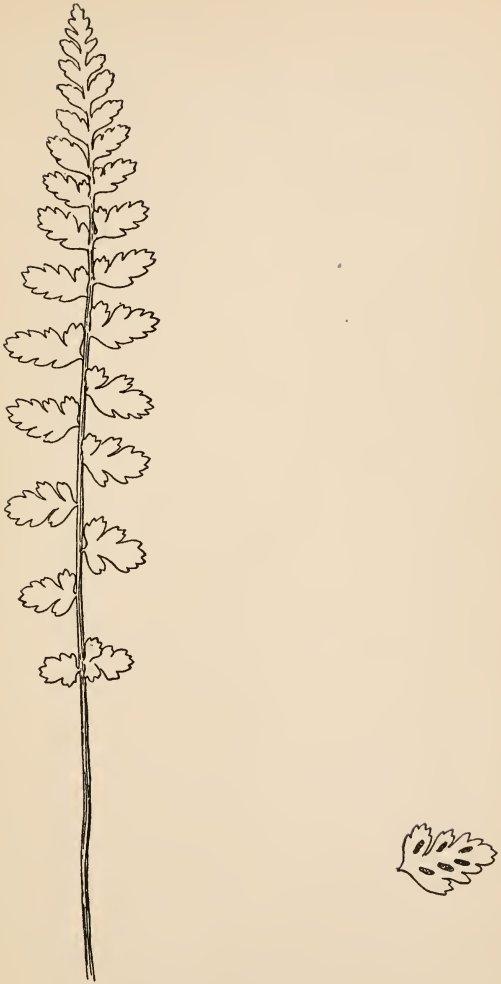
Asplènium Bradlèyi.

Fronds 3 to 10 inches high, long lance-shaped, pinnate; pinnae short-stalked, blunt, lower ones no larger than the middle ones, cut into oblong, toothed lobes; stipes dark and somewhat shining.

Fruit dots as in other spleenworts.

Found on cliffs and rocks from eastern New York to Kentucky, Missouri and southward; rare.

NOTES.



Bradley's Spleenwort.

NOTES.

NOTES.

SENSITIVE FERN: *Onoclèa sensíbilis.*

Sterile and fertile fronds dissimilar; sterile fronds 1 to 3 feet high on long stipes, deeply pinnatifid, the divisions long lance-shaped, wavy-edged or deeply-lobed, the lower often distinct; fertile fronds shorter, closely twice pinnate, the pinnules rolled up into berry-like bodies enclosing the sori, appearing later than the sterile. The dried fertile fronds are conspicuous in the late fall and early spring.

Common in moist meadows and thickets; widely distributed.

NOTES.

Sensitive Fern.

SENSITIVE FERN, form *obtusilobata*

Onoclèa sensibilis, f. obtusilobàta.

These various forms of the sensitive fern are intermediate between the normal sterile and fertile fronds, and often follow the cutting of the early sterile fronds.

NOTES.

Sensitive Fern, Form *Obtusilobàta.*

OSTRICH FERN: *Onoclèa Struthiópteris.* (*Struthiopteris Germanica; Matteuccia Struthiopteris.*)

Sterile and fertile fronds widely dissimilar; sterile fronds 3 to 7 feet high growing in circles, broadest toward the apex, which is abruptly narrowed, pinnate; pinnae long and narrow, cut nearly to the midrib into close, short, slightly-curving lobes; fertile fronds short, stiff, pinnate, with long, narrow, beaded-edged pinnae, appearing in midsummer within the circle of the sterile ones.

Fronds intermediate between the sterile and fertile are sometimes produced by the cutting of the early sterile fronds.

Found in swampy places, and along the borders of streams and ponds, from Newfoundland to Virginia and northwestward.

NOTES.

Ostrich Fern.

BRACKEN; BRAKE; EAGLE FERN:

Ptèris aquilìna.

(*Pteridium aquilinum.*)

Frond large and spreading, 1 to 3 feet high, borne on the summit of an erect stalk, triangular in outline, divided into three principal divisions; the widely spreading side divisions are twice pinnate, the lower pinnules more or less pinnatifid, with oblong, obtuse lobes, variable in their shape and cutting.

The fruit is borne on the margins of the pinnules in a continuous line, covered by an indusium formed by the reflexed edges of the pinnules.

Common in thickets and on hillsides, widely distributed.

A variety known as *P. pseudocaudàta* has narrow and much elongated pinnules.

NOTES.

Brake.

PURPLE CLIFF BRAKE:

Pellaèa atropurpùrea.

Fronds 4 to 24 inches high, of a peculiar, bluish-green color; pinnate or twice pinnate below, but very irregular in the matter of division, lobed or forking pinnules common; fertile fronds somewhat taller than the sterile, and the pinnules longer and narrower; stipes dark.

Fruit dots marginal, covered with an indusium formed by the reflexed edges of the pinnules.

Found on rocks in limestone regions from New England to Georgia and westward.

NOTES.

Purple Cliff Brake (a).

NOTES.

Purple Cliff Brake (b).

SLENDER CLIFF BRAKE:

Cryptográmma Stellèri.
(*Pellaea gracilis.*)

Fronds 3 to 6 inches in length, and quite dissimilar; fertile fronds usually twice pinnate with narrow pinnules, taller and more erect than the sterile ones; sterile fronds generally pinnate, with pinnatifid pinnae, and broad, blunt segments, which are more or less irregularly notched.

Fruit dots borne close to the margin, covered with a broad indusium, which usually extends entirely around the pinnule.

A delicate species, requiring shade and moisture, found on limestone rocks from New Brunswick and Quebec to Vermont, Connecticut, Pennsylvania, Illinois and Colorado.

NOTES.

Slender Cliff Brake.

DENSE CLIFF BRAKE:

Cryptográmma dénsa.
(*Pellaea densa.*)

Fronds 4 to 8 inches high, usually three times pinnate, nearly every frond fertile. In the fertile fronds the pinnules curve back over the sori and have the appearance of narrow, half-open, sharp-pointed pods, from a quarter to half an inch in length; segments of the sterile fronds broader, acute, and sharply toothed; stipes dark.

Fruit dots and indusium marginal.

Found on cliffs, growing in dense tufts, on Mt. Albert in Quebec, in Grey County, Ontario, and in the far west.

NOTES.

Dense Cliff Brake.

ROCK BRAKE: *Cryptográmma acrostichoìdes.*

Sterile and fertile fronds dissimilar, 6 to 8 inches high; sterile fronds twice to three times pinnate, pinnae deeply cut into lobed and toothed, rounded pinnules; fertile fronds three times pinnate, with long, narrow, pod-like divisions, the edges of which roll back to the midrib, and later spread out nearly flat.

Fruit dots borne near the margins of the divisions.

Found growing in clumps in the crevices of rocks from Lake Huron, Lake Superior, Colorado and California, to the Arctic regions.

NOTES.

Rock Brake.

LONG BEECH FERN:

Phegópteris polypodioìdes.
(*P. Phegopteris.*)

Fronds triangular, longer than broad, often 18 inches high, pinnate; pinnae long, narrow, acute, cut nearly to the midrib into oblong, blunt segments, the upper forming a lobed border along the rachis, the lower separate, standing forward and downward; intergrading forms between this and the broad beech fern frequent.

Fruit dots small, round, without indusia, borne near the margins of the segments.

Found in damp, rocky woods and along the borders of woodland brooks, from Newfoundland to Alaska, south to Virginia, Iowa, Wisconsin and Washington.

NOTES.

Long Beech Fern.

BROAD BEECH FERN:

Phegópteris hexagonóptera.

Fronds triangular, similar in appearance to those of the long beech fern, but usually broader than long, pinnate; pinnae lance-shaped, cut nearly to the midrib into oblong, blunt, more or less toothed segments; the lowest pair of pinnae much the largest, and the lower segments are much elongated. The lower pinnae form a continuous many-angled wing along the main rachis; variable in outline, and in the cutting of the pinnae.

Fruit dots small, without indusia, borne near the margins of the segments.

Found in rather open woods from Quebec and New England to Minnesota and southward.

NOTES.

Broad Beech Fern.

OAK FERN: *Phegópteris Dryópteris.*

Fronds usually less than one foot high, smooth, broadly triangular in outline, the three principal divisions triangular, stalked, and widely spreading, quite resembling the bracken in miniature. The middle division of the frond is slightly the largest, and the lower pinnules of the side divisions are the longest; stipes slender.

Fruit dots small, round, without indusia, borne near the margins of the lobes.

Found in moist, rocky woods from Newfoundland to Virginia.

LIMESTONE POLYPODY:
Phegópteris Robertiàna.
(*P. calcarea.*)

Fronds 8 to 18 inches long, similar in form to those of the oak fern, but are minutely glandular, and the terminal division is much larger than the two side divisions.

Fruit dots small, round, without indusia, borne near the margins of the lobes.

Found on shaded limestone from Labrador to Quebec, Iowa, Minnesota and Manitoba; rare.

Oak Fern.

NOTES.

CHRISTMAS FERN:

Polýstichum acrostichoìdes.
(*Aspidium acrostichoides.*)

Fronds 1 to 3 feet high, evergreen, lance-shaped, acute, pinnate; pinnae firm, narrow, finely toothed, eared on the upper side at the base, arranged mostly alternately; fertile fronds taller than the sterile, and differ from them in having the upper fruiting pinnae reduced in size; stipe scaly.

Fruit dots borne in rows lengthwise of the pinnae, eventually running together, covering the whole of the under surface with the brown sporangia.

The variety *incìsum* may be distinguished by its deeply-toothed pinnae, and by the fruit dots continuing downward on the tips of the ordinary pinnae, gradually decreasing in number; rarely the pinnae are cut to the midrib.

The variety *crìspum* has beautifully-crisped and ruffled pinnae.

Common in rocky woods from Canada to Florida, Mississippi, Arkansas and Wisconsin.

NOTES.

Christmas Fern (a).

Christmas Fern (b).

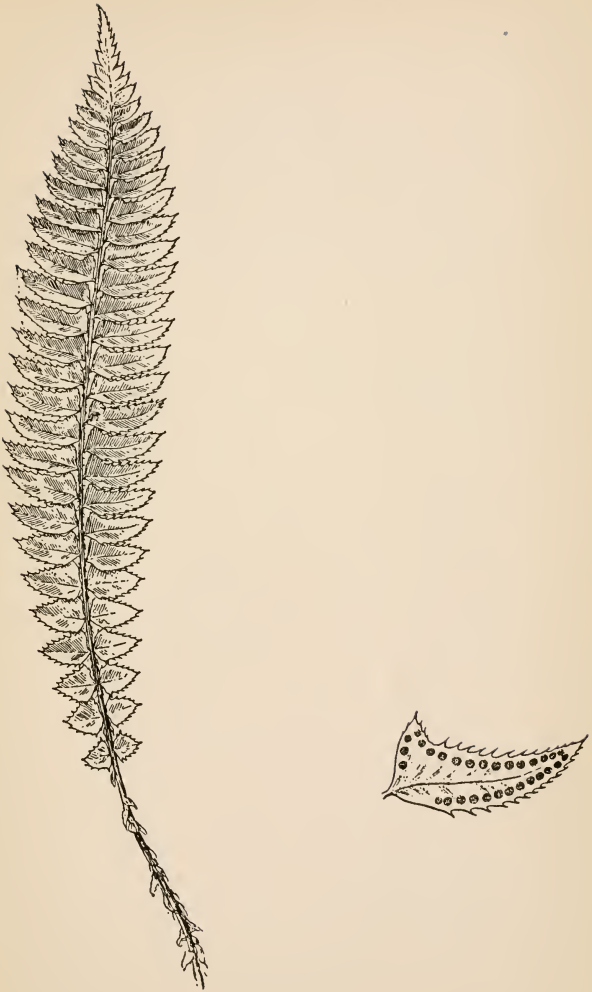
HOLLY FERN: *Polýstichum Lonchìtis.*
(*Aspidium Lonchitis.*)

Fronds 6 to 24 inches high, long lance-shaped, tapering toward the base, short-stalked, pinnate; pinnae rather broad, spiny-toothed, eared on the upper side and curving upward, the lowest shorter and triangular.

Fruit dots round, borne on the backs of the upper pinnae in two rows midway between the midrib and the margins, and also upon the ears.

Found in rocky woods from Nova Scotia to southern Ontario, and far north and west.

NOTES.



Holly Fern.

BRAUN'S HOLLY FERN:

Polýstichum Braúnii.

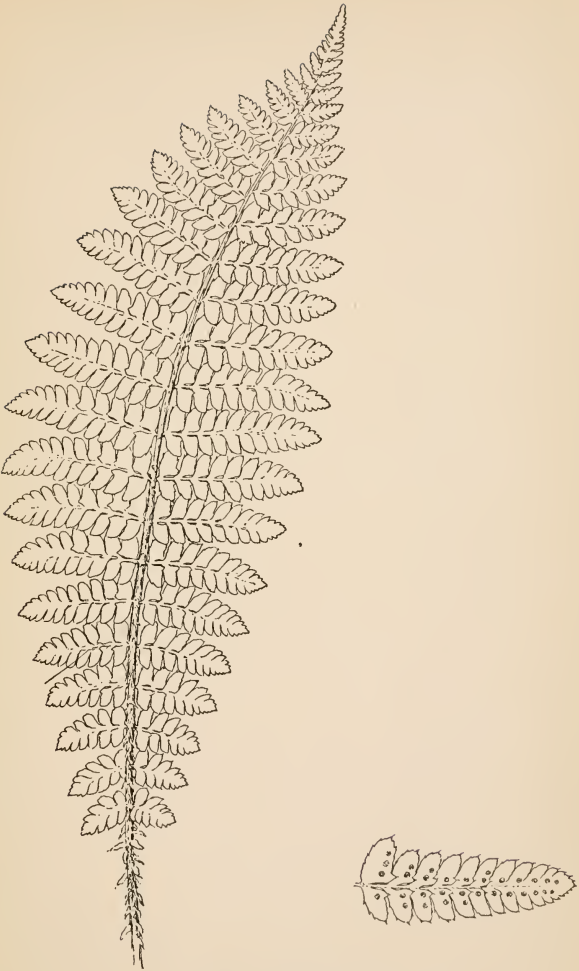
(*Aspidium aculeatum,* var. *Braunii.*)

Fronds 1 to 3 feet long, tapering toward the base, evergreen, short-stalked, twice pinnate; pinnae broadest at the base, acute; pinnules inclined to be eared, sharply toothed; both stipe and rachis covered with chaffy hairs and brown scales.

Fruit dots not very conspicuous, borne on the backs of the ordinary fronds.

Found in rich upland woods from Newfoundland to Lake Superior, and in the mountains of Pennsylvania.

NOTES.



Braun's Holly Fern.

NOTES.

NOTES.

MARSH FERN: *Aspídium Thelýpteris.* (*Nephrodium; Dryopteris.*)

Fronds lance-shaped in outline, slightly narrowed at the base, pinnate; pinnae set at right angles to the rachis, rather narrow, cut nearly to the midrib into short, blunt lobes; first fronds always sterile, the fertile fronds not appearing until midsummer. The pinnules of the fertile fronds appear to be narrower and more pointed than those of the sterile ones, owing to their reflexed margins, which nearly cover the fruit dots; stipes long, sometimes twice as long as the blades; veins forking.

Fruit dots small, borne in two rows on each pinnule; indusium minute, soon withering, the sporangia spreading out and nearly covering the under surface of the pinnule.

Common in marshes, widely distributed.

NOTES.

Marsh Fern.

NEW YORK FERN:

Aspídium noveboracénse.

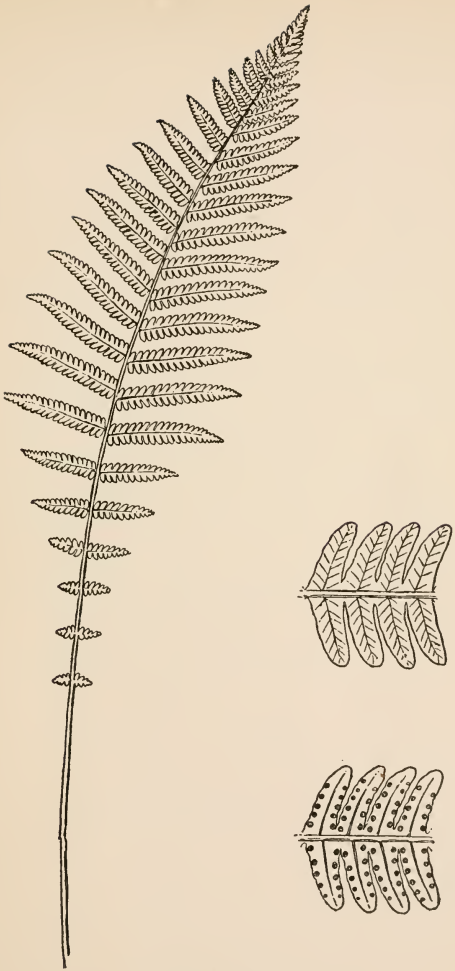
(*Dryopteris noveboracensis; Nephrodium noveboracense.*)

Fronds 8 to 24 inches long, widest in the middle, tapering both ways, pinnate; pinnae long and narrow, deeply cut into rounded lobes; below, the pinnae become more distant, and reduced in size to mere ears, forming a distinguishing feature of this fern; veins simple, or forked only in the basal lobes; fertile fronds appearing later than the sterile.

Fruit dots distinct, borne near the margin; indusium minute.

Common in rich woods, widely distributed.

NOTES.



New York Fern.

MASSACHUSETTS FERN:

Aspídium simulàtum.

(*Nephrodium; Dryopteris simulata.*)

This fern is similar in habit to the marsh fern and the New York fern, but may be distinguished from them by the following characteristics: the lower pinnae are somewhat contracted, but are never so small as those of the New York fern; the simple (not forking) veins distinguish it from the marsh fern.

Found in wet woods from Maine to Pennsylvania and Maryland.

NOTES.

Massachusetts Fern.

MARGINAL SHIELD FERN:

Aspídium marginàle.

(*Nephrodium; Dryopteris marginalis.*)

Fronds 1 to 3 feet long, growing in circles, evergreen, pinnate to twice pinnate; pinnae lance-shaped, pointed; pinnules slightly curving, and in the lower pinnae may be lobed; stipes chaffy.

Fruit dots conspicuous, borne close to the margins of the pinnules without crowding; indusium convex, whitish.

Found in rich woods from Nova Scotia to Georgia, Alabama and westward.

NOTES.

Marginal Shield Fern (a).

NOTES.

Marginal Shield Fern (b).

MALE FERN: *Aspídium Fìlix-más.*
(*Nephrodium; Dryopteris.*)

Fronds 1 to 4 feet long, lance-shaped, standing in circles; pinnae narrowly lance-shaped, tapering from the base toward the apex; pinnules oblong, blunt, sharply toothed at the apex, obscurely so at the sides, the basal lobed and distinct; stipes scaly.

Fruit dots nearer the midvein than the margin, usually confined to the lower half of each fertile pinnule.

Found in rocky woods from the far north to Newfoundland, Nova Scotia, northern Vermont, Lake Superior, Lake Huron, Dakota, Arizona and California.

NOTES.

Male Fern.

GOLDIE'S SHIELD FERN:

Aspídium Goldieànum.

(*Nephrodium; Dryopteris Goldieana.*)

Fronds large and broad, often 4 feet high, nearly twice pinnate; pinnae broadest near the middle, cut nearly to the midrib into long, blunt, slightly-toothed, curving pinnules.

Fruit dots borne near the midvein; indusium very large, smooth and without marginal glands.

Found in moist woods from Canada to New England, Tennessee and Minnesota.

The variety *célsum* differs from the type in being narrower, with pinnae and pinnules farther apart, and the lowest pinnae on rather long stalks; found on old decaying logs.

NOTES.

Goldie's Shield Fern.

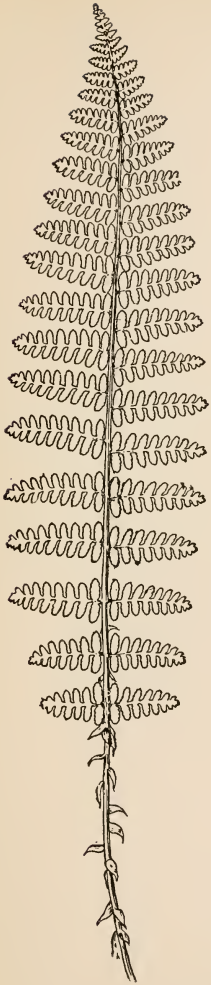
FRAGRANT FERN: *Aspídium fràgrans.*
(*Nephrodium; Dryopteris.*)

Fronds 4 to 12 inches long, narrowly lance-shaped, glandular and aromatic, twice pinnate; divisions of the pinnae obtuse, more or less toothed; stipes short, bearing chaffy, brown scales. The old fronds droop and curl in a characteristic manner.

Indusia very large, nearly covering the under surface of the pinnules.

Found on cliffs from northern New England to Minnesota and northward.

NOTES.



Fragrant Fern.

CRESTED SHIELD FERN:

Aspidium cristàtum.

(*Nephrodium; Dryopteris cristata.*)

Fertile fronds quite erect, often 3 feet high, much taller than the sterile, which are somewhat reclining, pinnate; pinnae broadest at the base, tapering toward the tips, the lowest pair almost triangular, deeply pinnatifid; pinnules 6 to 10 pairs, oblong, blunt, finely toothed, the lower pinnatifid-lobed, and those nearest the rachis sometimes separate; stipes chaffy.

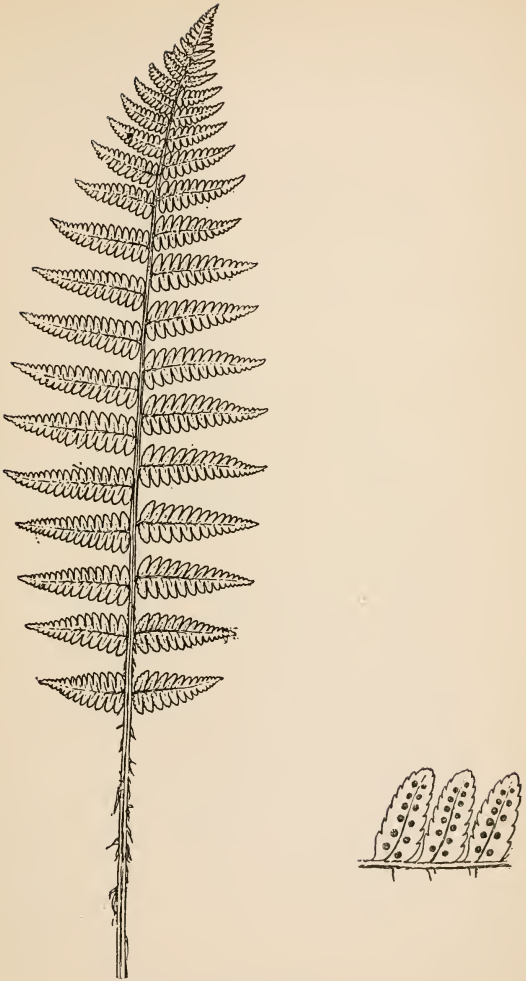
Owing to the upright stalks of the fertile fronds the pinnae arrange themselves nearly in a horizontal plane, thus appearing farther apart than those of most species.

Fruit dots as near the midvein as the margin; indusium broad and conspicuous, smooth.

Found in swampy woods from Canada to North Carolina, Arkansas and Idaho.

The variety *Clintoniànum* has larger and broader fronds, pinnae cut into 8 to 16 pairs of pinnules.

The crested ferns often hybridize with the marginal shield ferns, producing intermediate or distorted fronds.



Crested Shield Fern (a).

NOTES.

Crested Shield Fern (b).

BOOTT'S SHIELD FERN:

Aspídium Boóttii.
(*Nephrodium; Dryopteris.*)

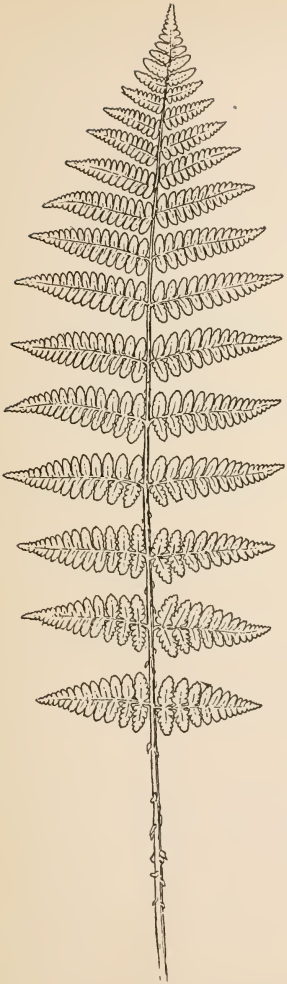
Fronds quite erect, 1 to 2½ feet tall, long lance-shaped in outline, somewhat narrowed at the base; fertile fronds taller than the sterile, twice pinnate below, a feature by which it may be distinguished from the crested ferns; pinnae horizontal as in the crested ferns, the lower somewhat triangular, the upper longer and narrower; pinnules spiny-toothed, the lower pinnatifid; scales on stipe pale brown.

Fruit dots borne in a double row on the pinnules; indusium minutely glandular.

Boott's shield fern seems to stand half way between *A. spinulosum,* var. *intermedium* and *A. cristatum,* and is thought by many to be a hybrid between the two. The cutting is like the former, while in shape it resembles the latter; apparently variable.

Found in swampy woods in Canada and the northeastern part of the United States.

NOTES.



Boott's Shield Fern.

SPINULOSE SHIELD FERN:

Aspídium spinulòsum.

(*Nephrodium; Dryopteris spinulosa.*)

Fronds 1 to 3 feet high, finely cut with a delicate, lace-like effect, twice pinnate; pinnae oblique to the rachis, elongated-triangular, the lowest pairs broadly triangular; pinnules set obliquely to the midribs, with spiny-toothed lobes, those on the lower side usually elongated especially in the lowest pinnae; scales on the stipes pale brown.

Fruit dots borne on the backs of the ordinary fronds; indusium smooth, without marginal glands.

Found in rich woods from Virginia and Kentucky to the far north.

In the variety *intermèdium* the margin of the indusium is irregular and beset with minute, stalked glands, and the scales on the stipe are brown with a darker center; common.

In the variety *dilatàtum* the fronds are long egg-shaped in outline, the lower pinnules often much elongated, the indusium smooth without marginal glands, and the scales on the stipe have dark centers. Found chiefly in rocky, upland woods.

NOTES.

Spinulose Shield Fern (a).

NOTES.

Spinulose Shield Fern (b).

NOTES.

NOTES.

COMMON or VIRGINIAN CHAIN FERN:
Woodwárdia virgínica.

Fronds 2 to 4 feet high, with stipes nearly as long as the blades, quite similar in appearance to the sterile fronds of the cinnamon fern, pinnate; pinnae lance-shaped, cut nearly to the midrib into blunt, slightly-curving segments.

Fruit dots elongated, borne in two series: one series borne parallel to the midribs of the pinnae, and the other parallel to the midribs of the segments.

Found in swamps from Nova Scotia to Florida, Louisiana, Michigan and Ontario.

NOTES.

Virginian Chain Fern.

NARROW-LEAVED CHAIN FERN:

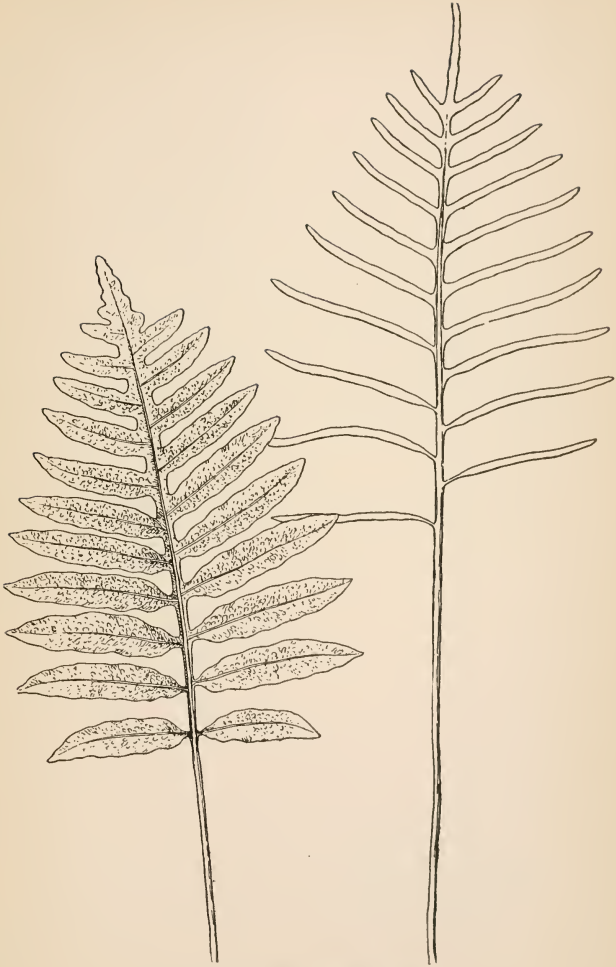
Woodwárdia areolàta.

(*W. angustifolia.*)

Sterile and fertile fronds dissimilar; sterile fronds 12 to 20 inches long, cut nearly to the midrib into oblong, acute, finely-toothed divisions, the lower divisions often narrowed abruptly at the base, the upper connected by a broad wing; fertile fronds taller than the sterile, appearing later, pinnate, with long, very narrow and distant pinnae, which are just wide enough for two lines of large, elongated, sunken fruit dots; indusium thick; stipes black and shining. There are many gradations between the two classes of fronds.

Found in wet woods, chiefly near the Atlantic coast, from Maine to Florida and Texas, locally inland in Arkansas and Michigan.

NOTES.



Narrow-Leaved Chain Fern.

HAIRY LIP FERN: *Cheilánthes lanòsa.* (*C. vestita.*)

Fronds 6 to 15 inches long, narrowly lance-shaped in outline, hairy, twice pinnate; pinnae rather distant; pinnules deeply lobed; stipes dark and hairy; bears a strong resemblance to the rusty Woodsia, from which it may be distinguished by the absence of a joint on the stipe.

Fruit dots very small, marginal, the ends of the lobes of the pinnules reflexed, but pushed back by the ripening sporangia.

Found on cliffs from Connecticut to Minnesota, Wyoming and southward.

NOTES.

Hairy Lip Fern.

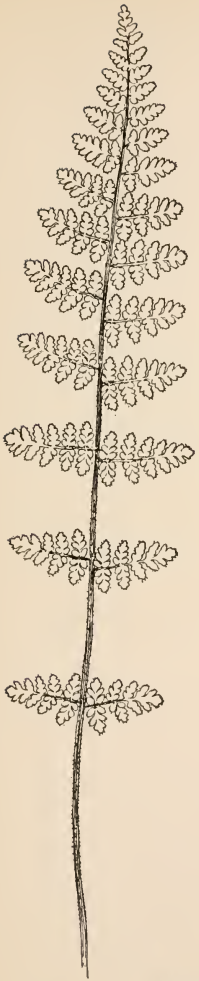
WOOLLY LIP FERN: *Cheilánthes tomentòsa.*

Fronds 8 to 20 inches high, long lance-shaped, densely woolly, especially beneath, bearing a general resemblance to the hairy lip-fern, but is three times pinnate; ultimate pinnules very small, rounded; stipes dark, densely woolly.

Fruit dots marginal; indusium formed by the reflexed edges of the pinnules.

Found on exposed rocks from Virginia and Kentucky southward and westward.

NOTES.



Woolly Lip Fern.

FEE'S LIP FERN: *Cheilánthes Feèi.*
(*C. lanuginosa.*)

Fronds 3 to 8 inches long, densely woolly on the under side, slightly so above, twice or three times pinnate; pinnules pinnatifid, or mostly divided into small, roundish segments, terminal one the largest; lowest pinnae rather distant; stipes dark, hairy at first.

Fruiting portion much as in other lip ferns.

Found on rocks in dense mats from Illinois and Minnesota westward and southward.

NOTES.

Fee's Lip Fern.

ALABAMA LIP FERN:

Cheilánthes alabaménsis.

Fronds 4 to 16 inches long, smooth, lance-shaped in outline, twice pinnate; pinnae numerous, short-stalked; pinnules often eared or lobed; stipes dark, slender.

Fruit dots marginal; indusium formed by the reflexed margins of the pinnules, pale, rather broad, nearly continuous.

Found on rocks from Virginia to Missouri and southward.

NOTES.

Alabama Lip Fern.

COMMON POLYPODY: *Polypòdium vulgàre.*

Fronds 4 to 10 inches high, evergreen, smooth on both sides, deeply pinnatifid, occasionally variable in their form and cutting.

Fruit dots large, without indusia, borne midway between the midvein and the margin.

Common, especially northward, growing in colonies on shaded rocks.

NOTES.

Common Polypody (a).

NOTES.

Common Polypody (b).

GRAY or HOARY POLYPODY:

Polypòdium polypodioìdes.

(*P. incanum.*)

Fronds 2 to 7 inches long, evergreen, deeply pinnatifid with blunt divisions; similar in appearance to those of the common polypody, but may be distinguished by the stipe and under surface of the frond being thickly covered with gray or brownish scales fastened at the center.

Fruit dots rather small, without indusia, and near the margin.

Found on rocks and the trunks of trees, Virginia, Ohio, Iowa and southward.

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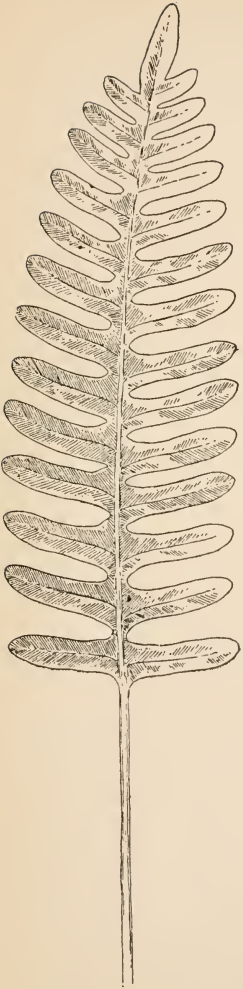
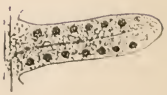




Gray Polypody.

NOTES.

NOTES.

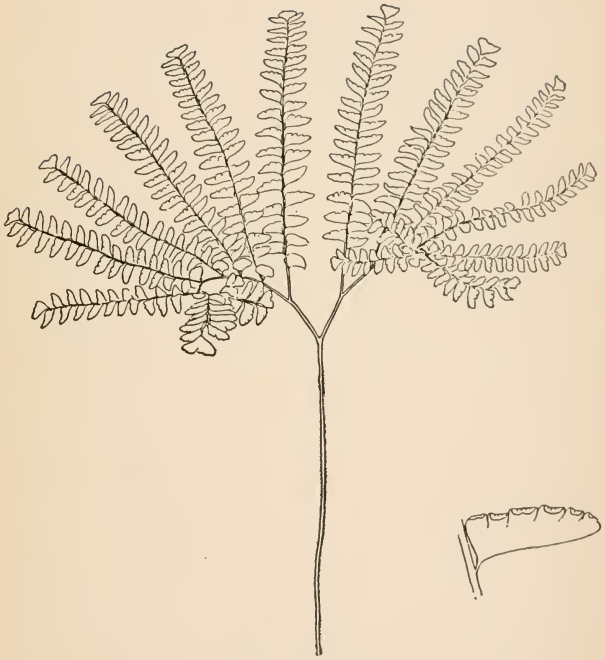
MAIDENHAIR FERN: *Adiántum pedàtum.*

Fronds 8 to 20 inches high, nearly circular in outline; stipes dark and shining, erect, forked at the summit, each branch bearing on one side several pinnate divisions; pinnules numerous, short-stalked, without a midvein.

Fruit dots marginal; indusium formed by the reflexed edges of the toothlets. Nearly every frond fertile.

Found in moist woods, growing in clumps, widely distributed.

NOTES.



Maidenhair Fern.

VENUS'-HAIR FERN:

Adiántum Capíllus-Véneris.

Fronds 4 to 20 inches high, with a continuous main rachis, twice or three times pinnate at the base, simply pinnate above; pinnules broad or narrow wedge-shaped, their outer edges deeply toothed or notched; veins springing from the base like the ribs of a fan.

Fruit dots marginal; indusium formed by the reflexed edges of the pinnules.

Found in moist, rocky places from southeastern Pennsylvania to Missouri and Florida, also in Dakota and southwestward.

NOTES.

Venus'-Hair Fern.

RUSTY WOODSIA: *Woódsia ilvénsis.*

Fronds long lance-shaped in outline, seldom more than 8 inches high, pinnate; pinnae cut nearly to the midrib into short, rounded, closely-set lobes. The fronds are clothed underneath with a dense, woolly coating, which soon turns to a rusty brown, and almost conceals the fruit dots. The young fronds, when unrolling, are covered with silvery-white, hair-like scales. Stipes rather short, possessing an obscure joint an inch or more above the base, at which point the old fronds separate, leaving the stubble. This characteristic serves to distinguish the rusty Woodsia from *Cheilanthes lanosa.*

Fruit dots borne near the margins of the lobes, running together when old.

Found on exposed rocks, growing in dense clumps, from the Arctic regions to the mountains of North Carolina.

NOTES.

Rusty Woodsia (a).

NOTES.

Rusty Woodsia (b).

OBTUSE WOODSIA: *Woódsia obtùsa.*

Fronds 8–20 inches long, broadly lance-shaped, minutely glandular-hairy, pinnate; pinnae rather distant, pinnatifid or pinnate below, with oblong, slightly-lobed pinnules. Both pinnae and pinnules are quite blunt. In this respect it differs from *Cystopteris fragilis,* with which it may be confused. The stipes are about a third as long as the blades, and bear scattered, brownish scales.

Fruit dots round, borne on or below the minute lobes; indusium fixed to the frond underneath the sorus, early splitting into several segments, which spread out in a ragged star shape.

Found on rocky banks and cliffs from Nova Scotia to Georgia and westward.

NOTES.

Obtuse Woodsia.

NORTHERN or ALPINE WOODSIA:

Woódsia alpìna.

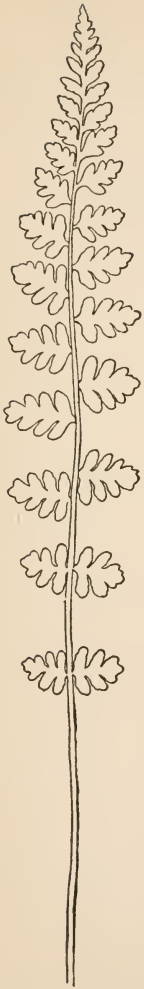
(*W. hyperborea.*)

Fronds 2 to 6 inches long, narrowly lance-shaped, growing in little tufts, smooth above, sparingly chaffy beneath, pinnate; pinnae somewhat triangular, blunt, cut nearly to the midrib into rounded lobes.

Indusium consists of a few hair-like processes which radiate from beneath the round sori.

Found in the mountains of New York, Vermont and Maine, and northward; rare.

NOTES.



Alpine Woodsia.

SMOOTH WOODSIA: *Woódsia glabélla.*

Fronds 2 to 5 inches high, rather narrow, very delicate, similar in appearance to the Alpine Woodsia, but the fronds and stipes (above the joint) are smooth and the lower pinnae are inclined to be more fan-shaped, slightly toothed.

Fruit dots scanty.

Found on moist rocks from northern New England, New York, Minnesota, to the far north.

NOTES.

Smooth Woodsia.

NOTES.

NOTES.

WALKING FERN; WALKING LEAF:

Camptosòrus rhizophýllus.

Fronds small, evergreen, 4 to 12 inches long, lobed or heart-shaped at the base, the early ones short and blunt, the fertile usually gradually tapering into a long, slender prolongation, which often takes root at the tip, forming a new plant.

Fruit dots elongated, scattered.

Found on rocks forming dense mats. Abundant locally from Maine to Ottawa and Minnesota, south to Kansas, Alabama and Georgia.

NOTES.

Walking Fern (a).

NOTES.

Walking Fern (b).

HAY-SCENTED FERN:

Dicksònia punctilóbula.

(*D. pilosiuscula; Dennstaedtia punctilobula.*)

Fronds 1 to 3 feet high, minutely glandular and hairy, twice pinnate; pinnae lance-shaped, pointed; pinnules deeply cut into toothed lobes.

Fruit dots minute, each borne on the margin of a recurved toothlet; indusium cup-like, open at the top.

Found in shade and sunlight, often forming large patches in upland pastures, from Nova Scotia to Minnesota and Alabama.

NOTES.

Hay-Scented Fern.

CLOAK FERN: *Notholaèna dealbàta.*
(*N. nivea,* var. *dealbata.*)

Fronds small, 2 to 6 inches long, once to four times pinnate; pinnae somewhat egg-shaped in outline, slender stalked, the ultimate pinnules very small, white and powdery on the under surface; stipes dark and shining.

Fruit dots roundish or oblong, without indusia, borne near the margins of the pinnules.

Found on limestone, Missouri, Kansas and southwestward.

NOTES.

Cloak Fern.

HART'S TONGUE: *Scolopéndrium vulgàre.* (*Phyllitis Scolopendrium.*)

Fronds long and narrow, rarely 20 inches in length or 2 inches in width, usually wavy-margined, somewhat heart-shaped or eared at the base, and often forked at the tip.

Fruit dots long and narrow, borne oblique or nearly at right angles to the midvein, opening along the middle.

Has been found in shaded, rocky places in a few spots in central New York, Tennessee, New Brunswick and Ontario.

NOTES.

Hart's Tongue.

COMMON BLADDER FERN:

Cystópteris frágilis.
(*Filix fragilis.*)

Fronds acute, seldom more than 15 inches long, twice or three times pinnate; pinnae mostly acute, pinnate or pinnatifid with narrow, lobed or toothed pinnules; fronds variable in their shape and cutting; stipe fully as long as the blade. It is sometimes confused with *Woodsia obtusa,* but the pinnae and pinnules of *Woodsia* are usually broader and more obtuse, and the indusium opens in a decidedly different manner from that of the bladder ferns.

Fruit dots rather small and thickly scattered over the lobes of the pinnules; indusium taper-pointed when young, attached to the pinnules by the base, and opening on the side toward the apex of the lobes, soon disappearing.

Found on shaded cliffs and in rocky woods, widely distributed.

NOTES.

Common Bladder Fern (a).

NOTES.

Common Bladder Fern (b).

BULBIFEROUS BLADDER FERN:

Cystópteris bulbífera.
(*Filix bulbifera.*)

Fronds 1 to 3 feet long, widest at the base, gradually tapering toward the tip, twice pinnate; pinnules pinnatifid or toothed; stipes short, rachis and pinnae often bearing bulblets beneath.

Fruit dots small, roundish; indusium opening on the side toward the tips of the lobes, soon withering.

Found on moist banks and rocks from Newfoundland to North Carolina, Alabama and westward.

NOTES.

Bulbiferous Bladder Fern (a).

Bulbiferous Bladder Fern (b).

THE CURLY GRASS FAMILY

CURLY GRASS: *Schizaèa pusílla.*

Fronds very narrow, grass-like, in no respect resembling those of ordinary ferns; sterile fronds an inch or more long, fertile fronds erect, 3 to 5 inches tall, bearing at the tip 4 or 5 pairs of short, crowded, finger-like pinnae which enclose the sporangia.

Found in low grounds and pine barrens of New Jersey, and in Nova Scotia and Newfoundland.

NOTES.

Curly Grass.

CLIMBING FERN: *Lygòdium palmàtum.*

Fronds climbing or twining, 12 to 40 inches long, with short, alternate branches scattered along the stipe, each branch forked and bearing a pair of leaflets or frondlets, which are divided into 4 to 7 finger-like lobes.

Fertile portion borne near the summit of the fronds, several times forked, the lobes contracted and forming small clusters.

Found locally in moist thickets and open woods, from New Hampshire to Florida, Tennessee and Kentucky.

NOTES.

Climbing Fern.

NOTES.

THE FILMY FERN FAMILY

FILMY FERN: *Trichómanes Boschiànum.* (*T. radicans.*)

Fronds 4 to 8 inches long, an inch or more wide at the base, tapering toward the apex, twice pinnatifid, the divisions lobed and toothed; rachis and upper part of stipe conspicuously winged.

Fruit dots marginal, sporangia clustered around a slender bristle, which is a prolongation of a vein, and surrounded by a vase-like receptacle. In old fronds the bristle is long and prominent.

Found on moist cliffs from Kentucky to Alabama.

NOTES.

Filmy Fern.

THE ADDER'S TONGUE FAMILY

ADDER'S TONGUE:

Ophioglóssum vulgàtum.

Sterile frond leaf-like, 2 to 4 inches long, usually elliptic or egg-shaped, rather fleshy, borne near the middle of the common stalk; midvein indistinct or none, the principal veins forming a loose network, the meshes nearly free from secondary veins. The fertile spike bears two rows of sporangia at the top of the stalk; 3 to 10 inches high. Slightly varying forms are occasional.

Found in wet meadows, but not common, from Canada to Florida, west to Missouri and California.

NOTES.

Adder's Tongue.

NOTES.

LANCE-LEAVED GRAPE FERN:*

Botrýchium lanceolàtum, var. *angustisegméntum.*

The lance-leaved grape fern consists of a sterile and fertile portion surmounting a common stalk. The sterile division is triangular in outline, seated near the top of a long, slender stalk, with two or more pairs of pinnae, the lowest pair being the largest, lobes acute; variable in its cutting; veinlets forking from a continuous midvein. The fertile portion rises but slightly above the sterile; 3 to 9 inches high.

Found from Nova Scotia to New Jersey, Ohio and Lake Superior.

* The Botrychiums are an exceedingly variable group, puzzling even to the expert botanists. For this reason no attempt has been made in this book to enumerate all the different varieties.

NOTES.

Lance-Leaved Grape Fern.

MATRICARY GRAPE FERN:

Botrýchium ramòsum.

(*B. matricariaefolium; B. neglectum.*)

The matricary grape fern is quite similar in form to the lance-leaved and intergrading forms are frequent. It is the more common of the two. The sterile division is egg-shaped or triangular in outline, joined to the main stalk by a short stem, varying from pinnate to twice pinnatifid, the lobes rather blunt; midvein dissipated into forking veinlets. The fertile portion rises above the sterile, usually disappearing by midsummer; 4 to 12 inches high.

Found in rich soil from eastern Quebec to Maryland and westward.

NOTES.

Matricary Grape Fern.

LITTLE GRAPE FERN:

Botrýchium símplex.
(*B. tenebrosum.*)

This fern is one of the rarest and smallest of the Botrychiums, usually less than 3 inches high. The sterile segment is short-stemmed, joined to the main stalk anywhere from near the base to the summit. It is thickish, roundish or 3 to 7 lobed, the lobes roundish, scarcely toothed; veins all forking from the base. The fertile spike rises above the sterile and may be simple or compound.

Found in moist woods or open places from Nova Scotia to Maryland, Ontario, Minnesota and the Rocky Mountains; rare.

NOTES.

Little Grape Fern.

COMMON GRAPE FERN:

Botrýchium oblìquum.
(*B. ternatum,* var. *obliquum.*)

Sterile frond somewhat triangular in outline, with 6 or more pairs of stalked pinnae, which are again pinnate or lobed, exceedingly variable in their cutting, and several varieties have been named; often fails to make its appearance until midsummer. Fertile portion stands erect, much taller than the sterile, and fruits rather heavily; 6 to 18 inches high. Sterile and fertile portions terminate separate stalks springing from the base.

Found in pastures and open woods from New Brunswick and Ontario to Minnesota and southward.

B. ternàtum, var. *intermèdium* is similar in habit to the preceding, but the ultimate segments are more numerous and usually more rounded at the apex. Found in open woods and pastures in New England and New York.

NOTES.

Common Grape Fern.

DISSECTED GRAPE FERN:

Botrýchium oblìquum, var. *disséctum.*

Sterile fronds finely dissected, the ultimate segments ending in small Y-shaped divisions; often found in company with the typical form.

NOTES.

Dissected Grape Fern.

RATTLESNAKE FERN:

Botrýchium virginiànum.

The rattlesnake fern consists of a single stalk, surmounted by a single frond, which is divided into a sterile and fertile portion. The sterile part is broadly triangular, the lowest pair of pinnae being so large as to appear as if the frond were divided into three principal divisions. The fertile portion, which rises above the sterile, discharges its spores early, and withers often by July. Many plants are sterile.

A solitary species, sometimes 3 feet in height, but commonly much less, found in shaded woods; widely distributed throughout the United States.

NOTES.

Rattlesnake Fern.

MOONWORT: *Botrýchium Lunària.*

The moonwort bears a single frond divided into a sterile and fertile portion. The sterile frond consists of 5–15 half-moon or fan-shaped lobes or pinnae, more or less toothed. The veins radiate from the base of each pinna and fork repeatedly. The fertile portion usually rises above the sterile.

A fleshy little plant, usually less than one foot high, growing in old fields. It is a northern species, rare within its southern limits, ranging from Greenland and Alaska south to the New England states, New York and westward; rare.

A similar form found in central New York has been named *B. Onondagense.*

NOTES.

Moonwort.

NOTES.

NOTES.

NOTES.

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